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EXAMINER	
ROSARIO, DENNIS	

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2624	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	09/892,076	HANABUSA, MITSUGU	
	Examiner	Art Unit	
	Dennis Rosario	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 October 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *12,17-19 and 22-27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *12,17-19 and 22-27* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *26 June 2001 and 19 July 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. The amendment was received on 10/26/07. Claims 12,17-19 and 22-27 are pending.

Response to Arguments

2. In response to applicant's argument on page 8, 2nd to last paragraph that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., "...photoelectric conversion elements.") are not recited in the body of the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

3. Applicant's arguments on page 8, last sentence that continues to page 9 filed 10/26/07 have been fully considered but they are not persuasive and states:

"Cox et al. cannot 'add up two signals outputted from two adjacent element during serially transferring the signals,'..."

The examiner respectfully disagrees since Cox does add up two signals (corresponding to "added together" in col. 10, line 23) outputted from two adjacent elements (corresponding to "adjacent column pixels" in col. 10, line 26) during serially transferring (using a horizontal shift register that transfers pixel values horizontally across an array as shown in fig. 9, num. 550 for reading and said adding or accumulation of said adjacent column pixels as both are done in fig. 9,num. 520).

4. Applicant's arguments on page 10 of the remarks have been fully considered but they are not persuasive and states that Seachman does not teach the "wherein" limitation of claim 12.

Note that the "wherein" limitation is functional language and not given weight per MPEP 2114 and 2173.05(g) wherein 2114 states in the section: APPARATUS CLAIMS MUST BE STRUCTURALLY DISTIGUISHABLE FROM THE PRIO ART, 1st sentence:

"While features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function."

Thus, the "wherein" limitation describes functional relationships not structural relationships with other structural limitations of claim 12.

5. Applicant's arguments on page 10, 4th paragraph, second to last sentence have been fully considered but they are not persuasive and states:

"Therefore, there are no description of 'a pulse supply unit for supplying three types of the transfer pulses having different phases to said first shift register and supplying three types of the transfer pulses having different pulses to said second shift register, ' as recited in claim 12."

Note that no weight is given to the claimed "supplying three types of the transfer pulses having different phases to said first shift register and supplying three types of the transfer pulses having different pulses to said second shift register" since the function of supplying is a function of the claimed pulse supply unit per MPEP 2114 and 2173.05(g) as addressed in paragraph 4, above, and not a structural relationship with other structural limitations of apparatus claim 12.

6. Applicant's arguments on page 11, lines 3-5 have been fully considered but they are not persuasive and states:

"It is also respectfully submitted that the Examiner is improperly applying the concept of 'intended use' to claim language in the apparatus or device claims of the present application...Accordingly, the Applicant respectfully requests clarification as to why the claim language noted as 'intended use' is immaterial to the structure of the claimed apparatus. In this regard, the Applicant also respectfully requests that the Examiner identify exactly what claim language is considered to be immaterial to the structure as this is not clear from the Office Action."

Regarding claim 12, intended use is applied as follows:

An image processing apparatus (an apparatus claim) comprising:

a) a first element array having a plurality of photoelectric conversion elements arranged in a line (limitation a) is a structural limitation since a) describes physical characteristics of the first element array);

b) a second element array shifted from said first element array by a predetermined distance in a main scanning direction and having a plurality of photoelectric conversion elements arranged in a line (limitation b) is a structural limitation since b) describes physical characteristics of the second element array);

c) a first CCD shift register (the first shift register is a structural limitation) for serially transferring signals (serially transferring signals is a function of the shift register and is thus intended use) from said first element array (said structural limitation) in response to transfer pulses (in response to transfer pulses is a function of the first CCD shift register);

d) a second CCD shift register (the second shift register is a structural limitation) for serially transferring signals (serially transferring signals is a function of the shift register and is thus intended use) from said second element array (said structural limitation) in response to the transfer pulses (said functional limitation);

e) a pulse supply unit (which is a structural limitation) for supplying at least three types of the transfer pulses having different phases (supplying pulses is a function of the pulse supply unit and is thus intended use) to said first CCD shift register (said structural limitation) and supplying at least three types of the transfer pulses having different pulses (supplying pulses is a function of the pulse supply unit and is thus intended use) to said second CCD shift register (said structural limitation);

f) wherein said pulse supply unit (said structural limitation) supplies, in a low-resolution mode, said three types of the transfer pulses having different phases (supplying pulses at a certain mode having different phases is a function of the pulse supply unit and is thus intended use) to said first and second CCD shift registers (said structural limitations) in order to add, shift and output signals (add, shift and output are functions of a device and are intended use) which have been output from adjacent elements (a structural limitation) of said first and second element array (said structural limitations), and, in a high-resolution mode, only two types of the transfer pulses having different phases (supplying pulses at a certain mode having different phases is a function of the pulse supply unit and is thus intended use) to said first and second CCD shift registers (said structural limitations) so as to shift and output signals (shift and output signals is a function of an unclaimed device), which have been output from said first and second pixel arrays (said structural limitations), without addition (is a function of an unclaimed device).

In response to applicant's argument that the application of intended use is not clear, a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. Claim 22 is rejected under 35 U.S.C. 102(e) as being anticipated by Hashimoto (US Patent 6,956,605 B1).

The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Regarding claim 22, Hashimoto discloses a processing method for an image processing apparatus including a first element array having a plurality of photoelectric conversion elements arranged in a line, a second element array shifted from the first element array by a predetermined distance in a main scanning direction and having a plurality of photoelectric conversion elements arranged in a line, a first CCD shift register, and a second CCD shift register, comprising steps of:

a) transferring image signals (represented as φ lines in fig. 1) from said first element array (fig. 1, label "S") to said first CCD shift register (fig. 1, "V01") and from said second element array (fig. 1, non-labeled square that represents said "S") to said second CCD shift register (fig. 1, Ve1), in parallel (as shown in fig. 1);

b) serially transferring the image signals in said first and second CCD shift registers ,in a low resolution mode ("read mode B" in col. 8, line 23 at "512VX640H" in col. 8, line 30 is interpreted as low resolution), in accordance with three types of transfer pulses (as shown in fig. 12A) having different phases (as shown in fig. 12A) so as to add up two signals (or "signals are added" in col. 8, line 28 as "$a_{13}+a_{14}$" in col. 8, line 29) outputted from two adjacent elements during serially transferring the signals; and

c) serially transferring the image signals in said first and second CCD shift registers, in a high-resolution mode (or "read mode A" in col. 8, line 12 at "1,024 lines" in col. 8, line 14 is interpreted as high resolution), in accordance with only two types of transfer pulses having different phases (as shown in fig. 13 that shows at least two types of pulses that are all different from each other or have different phases as opposed to fig. 12B that shows signals in phase with each other or as shown in fig. 12A, labels ΦVo and Φve which transfer information as indicated in fig. 12A: Vo1-Vo3 and Ve1-Ve3) so as to output signals from said first and second pixels arrays without addition (or "read sequentially" in col. 8, line 15 as "a_{11}" in col. 8, line 16).

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cox et al. (US Patent 5,381,013) in view of Hirama (US Patent 5,998,815).

Regarding claim 22, Cox teaches a processing method for an image processing apparatus including a first element array having a plurality of photoelectric conversion elements arranged in a line, a second element array shifted from the first element array by a predetermined distance in a main scanning direction and having a plurality of photoelectric conversion elements arranged in a line, a first shift register, and a second shift register, comprising steps of:

a) transferring image signals from said first element array (fig. 9,num. 501) to said first CCD shift register (fig. 9,num. 550) and from said second element array (unlabeled symbol similar to 501) to said second shift CCD register (fig. 9,num. 551), in parallel;

b) serially transferring the image signals in said first and second CCD shift registers ,in a low resolution mode (corresponding to "lower resolution" in col. 2, line 21), in accordance with three types of transfer pulses having different phases (as shown in fig. 10 as φ_1-φ_3) so as to add up two signals (or "add the outputs" in col. 2, line 20) outputted from two adjacent elements during serially transferring the signals; and

c) serially transferring the image signals in said first and second CCD shift registers, in a high-resolution mode (corresponding to "higher reso-lution" in col. 2, lines 23,24), in accordance with only two types of transfer pulses having different phases (as shown in fig. 10 as φ_1-φ_3) so as to output signals from said first and second pixels arrays without addition (or "sequentially" in col. 2, line 23 is interpreted as reading signals one at a time in a sequence).

Cox does not teach only two types of transfer pulses, but does teach in col. 6, lines 12-16, "The manner of implementing control lines for effecting high resolution... would... be obvious to one skilled in the art." Thus, Cox suggest to one of ordinary skill in the art of sensors that a plurality of teaching are known to implement control lines as shown in fig. 1,num. 430 of which a detailed view is shown in fig. 4 as numerals 432, 433, 427, 423, 434, 424,426,425,431,435.

Hirama teaches a method of implementing control lines as shown in fig. 4,numerals 24 and 25 and the remaining limitation of:

a) only two types of transfer pulses (fig. 4,numerals 24 and 25) having different phases (by comparing figures 2A and 2B) so as to output signals from said first and second pixels arrays (fig. 4,numerals 4 and 5) without addition (since signals outputted from 4 and 5 are not added or "mixed" in col. 5, line 12 until the signals reach fig. 1,num. 7.

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify Cox's teaching of implementing control lines for high resolution with Hirama's teaching of control lines of fig. 4,numerals 24 and 25, because Hirama's teaching "improve[s]" in the abstract a signal "difference" in the abstract and col. 2, line 42 that is "conspicuous as the CCD...is increased in resolution" in col. 2, lines 42-44 and "must be corrected" in col. 2, line 44.

11. Claims 12, 24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Seachman (US Patent 4,281,254 A1) in view of Hashimoto (US Patent 6,956,605 B1).

Regarding claim 12, Seachman teaches an image processing apparatus comprising:

a) a first element array (or "one array" in col. 5, lines 66,67) having a plurality of photoelectric conversion elements arranged in a line;

b) a second element array (or "second array" in col. 5, line 68) shifted from said first element array by a predetermined distance in a main scanning direction and having a plurality of photoelectric conversion elements arranged in a line;

c) a first CCD shift register (fig. 3,num. 36) for serially transferring signals from said first element array in response to transfer pulses;

d) a second CCD shift register (fig. 3,num. 36 corresponding to the second array) for serially transferring signals from said second element array in response to the transfer pulses;

e) a pulse supply unit (fig. 1, CLOCK & TIMING LOGIC) for supplying at least three types of the transfer pulses having different phases to said first CCD shift register and supplying at least three types of the transfer pulses having different pulses to said second CCD shift register;

f) wherein said pulse supply unit (fig. 1, CLOCK & TIMING LOGIC) supplies (via output lines of fig. 1, CLOCK & TIMING LOGIC), in a low-resolution mode (not given patentable weight in an apparatus claim since no structural relation ship is claimed with the mode), said three types of the transfer pulses having different phases to said first (fig. 3,num. 36) and second CCD shift registers (said second array represented in fig. 3 as num. 36) in order to add, shift and output signals (interpreted as intended use) which have been output from adjacent elements (fig. 3,numerals 37-1 thru 37-7) of said first and second element array, and, in a high-resolution mode (not given patentable weight in an apparatus claim since no structural relation ship is claimed with the mode), only two types of the transfer pulses (via φ_1 and φ_2 of fig. 3) having different phases to said first and second CCD shift registers so as to shift and output signals (interpreted as intended use), which have been output from said first and second pixel arrays, without addition.

Seachman does not disclose the limitation of supplies said three types of transfer pulses to said first and second shift registers, but does teach that the invention can use three and four phases in col. 4, line 24. However, Seachman does not provide any details about using three and four phases. Thus, Seachman suggests to one of ordinary skill in the art to find a teaching about three and four phases to practice the invention using three and four phases.

Hashimoto teaches a three-phase system as shown in fig. 12A as suggested by Seachman and the remaining limitation of claim 12 of:

wherein said pulse supply unit supplies, in a low-resolution mode, said three types of the transfer pulses (as shown in fig. 12A) having different phases (as shown in fig. 12A) to said first (fig. 10, label V01-V03) and second shift registers (fig. 10, label Ve1-Ve3) in order to add, shift and output signals which have been output from adjacent elements (fig. 10, label "S") of said first and second element array, and, in a high-resolution mode, two types of the transfer pulses having different phases (as shown in fig. 13 that shows at least two types of pulses that are all different from each other or have different phases as opposed to fig. 12B that shows signals in phase with each other) to said first (fig. 10, label V01-V03) and second shift registers (fig. 10, label Ve1-Ve3) so as to shift and output signals, which have been output from said first and second pixel arrays, without addition.

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify Seachman's teaching of said three and four phase with Hasimoto's teaching of three phases as shown in fig. 12B, because Hashimoto's teaching provides a "high-quality image" in col. 15, line 47 under a plurality of situations.

Regarding claim 24, Hashimoto discloses the apparatus according to claim 12, wherein, in the high resolution mode, said pulse supply unit alternately repeats a first operation of continuously outputting signals (as shown in fig. 12A as V01,V02 and V03) from the first element array (fig. 1, V01), and a second operation of continuously outputting signals (fig. 12A, Ve2,Ve2 and Ve3) from the second element array (fig. 1, Ve1).

Claim 25 is similar to claim 24. Thus argument of claim 24 is equally applicable to claim 25.

12. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Seachman (US Patent 4,381,254) in view of Cox et al. (US Patent 5,381,013).

Regarding claim 12, Seachman teaches an image processing apparatus comprising:

a) a first element array (or "one array" in col. 5, lines 66,67) having a plurality of photoelectric conversion elements arranged in a line;

b) a second element array (or "second array" in col. 5, line 68) shifted (by "1/2" in col. 6, line 1) from said first element array by a predetermined distance in a main scanning direction and having a plurality of photoelectric conversion elements arranged in a line;

c) a first CCD shift register (fig. 3,num. 36) for serially transferring signals from said first element array in response to transfer pulses (interpreted as intended use);

d) a second CCD shift register (fig. 3,num. 36 corresponding to the second array) for serially transferring signals from said second element array in response to the transfer pulses (interpreted as intended use);

e) a pulse supply unit (fig. 1, CLOCK & TIMING LOGIC) for supplying at least three types of the transfer pulses having different phases to said first CCD shift register and supplying at least three types of the transfer pulses having different pulses to said second CCD shift register (interpreted as intended use);

f) wherein said pulse supply unit (fig. 1, CLOCK & TIMING LOGIC) supplies (via output lines of fig. 1, CLOCK & TIMING LOGIC), in a low-resolution mode (not given patentable weight in an apparatus claim since no structural relation ship is claimed with the mode), said three types of the transfer pulses having different phases to said first (fig. 3,num. 36) and second CCD shift registers (said second array represented in fig. 3 as num. 36) in order to add, shift and output signals (interpreted as intended use) which have been output from adjacent elements (fig. 3,numerals 37-1 thru 37-7) of said first and second element array, and, in a high-resolution mode (not given patentable weight in an apparatus claim since no structural relation ship is claimed with the mode), only two types of the transfer pulses (via φ_1 and φ_2 of fig. 3) having different phases to said first and second CCD shift registers so as to shift and output signals (interpreted as intended use), which have been output from said first and second pixel arrays, without addition (not given patentable weight in an apparatus claim since no structural relation ship is claimed with the mode).

Seachman does not disclose the limitation of supplies said three types of transfer pulses to said first and second shift registers, but does teach that the invention can use three and four phases in col. 4, line 24. However, Seachman does not provide any details about using three and four phases. Thus, Seachman suggests to one of ordinary skill in the art to find a teaching about three and four phases to practice the invention using three and four phases.

Cox et al. teaches a three-phase system as shown in fig. 11, numerals 508-510 as suggested by Seachman and the remaining limitation of:

a) supplies said three types of transfer pulses (fig. 9,num. 511-513) to said first (fig. 9,num. 550) and second shift registers (fig. 9, num. 552).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify Seachman's teaching of using three and four phases with Cox et al.'s teaching of using three phases, because Cox et al.'s teaching of "clock lines...can easily be implemented" in col. 6, lines 10,11.

13. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Seachman (US Patent 4,281,254 A1) in view of Hashimoto (US Patent 6,956,605 B1) as applied to claim 12 above, and further in view of Sayag (US Patent 5,585,847).

The combination of Seachman and Hashimoto does not teach the limitation of claim 17, but Hashimoto teaches that light is collected as suggested in fig. 18,num. 71, but is not clear where the light comes from. Thus, Seachman suggests to one of ordinary skill in the art of imaging that the light can be naturally occurring light or artificially created.

Sayag teaches a light as shown in fig. 6, num. 62 as suggested by Seachman of the combination and the remaining limitation of claim 17 of:

a) a light source (fig. 6,num. 62) for irradiating an original with light; and

b) imaging means (fig. 6,num. 65) for forming light reflected by the original into an image on said first and second element arrays.

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify Seachman's teaching of collecting light with Sayag's teaching of said light of fig. 6, because Sayag's light will enable one to take proper pictures in the dark that makes pictures hard to see without light.

14. Claims 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Seachman (US Patent 4,281,254 A1) in view of Hashimoto (US Patent 6,956,605 B1) and further in view of Sayag (US Patent 5,585,847) as applied to claim 17 above, and further in view of Saito et al. (US Patent 6,256,063 B1).

Regarding claim 18, the combination does not teach claim 18. However, Sayag of the combination teaches that a "digital... cameras" in col. 9, line 40 can be used and "designed" in col. 9, line 29 in accordance with the invention. Thus, Sayag suggests to one of ordinary skill in the art to find a teaching of a digital camera that can be used with the invention.

Saito et al. teaches a camera in fig. 2,num. 10 and the remaining limitation of claim 18 of:

a) analog gain control means (fig. 13,num. 324) for controlling an analog gain of a signal output from said first and second element arrays (fig. 13,num. 322); and

b) an analog/digital converter (within fig. 13, num. 324) for digitizing the signal controlled by said analog gain control means.

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify Sayag's teaching of the digital camera with Saito et al.'s teaching of a digital camera, because Saito et al.'s teaching fig. 13, num. 324 is an integrated circuit relative to a separate circuits as shown in fig. 5, num. 114,115 and 133 that perform the same operations of fig. 13,num. 324 thus saving space inside the camera.

Regarding claim 19, Saito et al. of the combination teaches the apparatus according to claim 18, further comprising:

a) shading correction means (or "gamma correction circuit" in col. 14, line 29) for performing shading correction for the digitized signal.

15. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Seachman (US Patent 4,381,254) in view of Cox et al. (US Patent 5,381,013) as applied to claim 12, above, further in view of Hashimoto (US Patent 4,910,599)

Regarding claim 23, the combination does not teach claim 23, but Cox et al. of the combination does teach that "control lines for effecting high resolution ...or low resolution...would be obvious to one skilled in the art." in col. 6, lines 12-16.

Hashimoto teaches using control lines as shown upon the output of fig. 2,num. 110 and 109 and claim 23 of

a) wherein at least one type of the transfer pulses (represented in fig. 13 as fs) supplied by said pulse supply unit in the low resolution mode (represented in fig. 13 as ORDINARY READING MODE) has a frequency which is twice as high as that of the transfer pulses (fig. 13, label fs/2) supplied in the high resolution mode (represented in fig. 13 as ZOOM READING MODE).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify Cox et al.'s teaching of control lines with Hashimoto's teaching of fig. 13, because Hashimoto's teaching suppresses "noises" in col. 1, line 55 while in the zoom reading mode.

16. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Seachman (US Patent 4,381,254) in view of Cox et al. (US Patent 5,381,013) as applied to claim 12 above, and further in view of Nagano (US Patent 5,126,860).

The combination teaches the last two limitation of the claimed "in the low-resolution mode" and "in the high-resolution mode" as discussed in claim 12, paragraph f), above, and does not teach the remaining limitation of claim 26, but Seachman of the combination does teach that the invention can use three and four phases in col. 4, line 24. However, Seachman does not provide any details about using three and four phases. Thus, Seachman suggests to one of ordinary skill in the art to find a teaching about three and four phases to practice the invention using three and four phases.

Nagano teaches a four-phase system as shown in fig. 4, labels Φ_R Φ_2 Φ_1 Φ_T as suggested by Seachman and the remaining limitations of claim 26 of:

a) a first type of register cells (fig. 2, SR_N) that receive signals from photoelectric conversion elements (fig. 2,num. 26) and shift (as indicated upon the output if fig. 2,num. 27) the received signals in response to a first pulses (fig. 2, Φ_T);

b) a second type (fig. 2, SR_{N-1}) of register cells positioned between two adjacent first type register cells (fig. 2, SR_N and SR_{N-2} is interpreted as the claimed first type of register cells that receive from said photoelectric conversion elements) that shift signal received from the adjacent first type of register cells in response to second (fig. 2, Φ_1) or third pulses; and

c) a third type (fig. 2, SR_{N-2}) of register cells positioned between two adjacent first type register cells (already addressed) that shift signals received from the adjacent first type of register cells in accordance with the third pulses (fig. 2, Φ_2).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify Seachman's teaching of using 3 and 4 phases with Nagano's teaching of using four-phase system of fig. 4, because Nagano's teaching provides an "inexpensive...apparatus" in col. 2, line 29.

17. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cox et al. (US Patent 5,381,013) in view of Nagano (US Patent 5,126,860).

Regarding claim 27, Cox et al. teaches the last two limitations of claim 27 in claim 22, above, and a plurality of positions and configurations of objects as shown in figures 1 and 2 and 3, num. 307 of a sensor array as shown in figures 9 and 11, but does not teach the remaining limitations of claim 27. Thus, Cox et al. suggests to one of ordinary skill in the art of sensors to design a configuration of a sensor array or arrays relative to other objects.

Nagano teaches a design as shown in fig. 2,num 14 as suggested by Cox et al. and claim 27 as was discussed in claim 26 above.

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify Cox et al.'s teaching of a plurality of configuration of figures 1-3 with Nagano' teaching of fig. 2,num. 12 for the same reasons as claim 26, above.

Conclusion

18. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Ohtsuru (US Patent 6,847,401 B1) is pertinent as teaching a method of using a three-phase system as shown in fig. 4 and high and low resolution in the first paragraph of column 4.

Kannegundla et al. (US Patent 5,489,945) is pertinent as teaching a method of using a three-phase system along with high resolution mode and TV-resolution mode as shown in fig. 8.

Sauer (US Patent 4,178,614) is pertinent as teaching a three-phase system as shown in fig. 3 and "increased resolution" in col. 2, line 66.

19. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dennis Rosario whose telephone number is (571) 272-7397. The examiner can normally be reached on 9-5.

20. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Bella can be reached on (571) 272-7778. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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